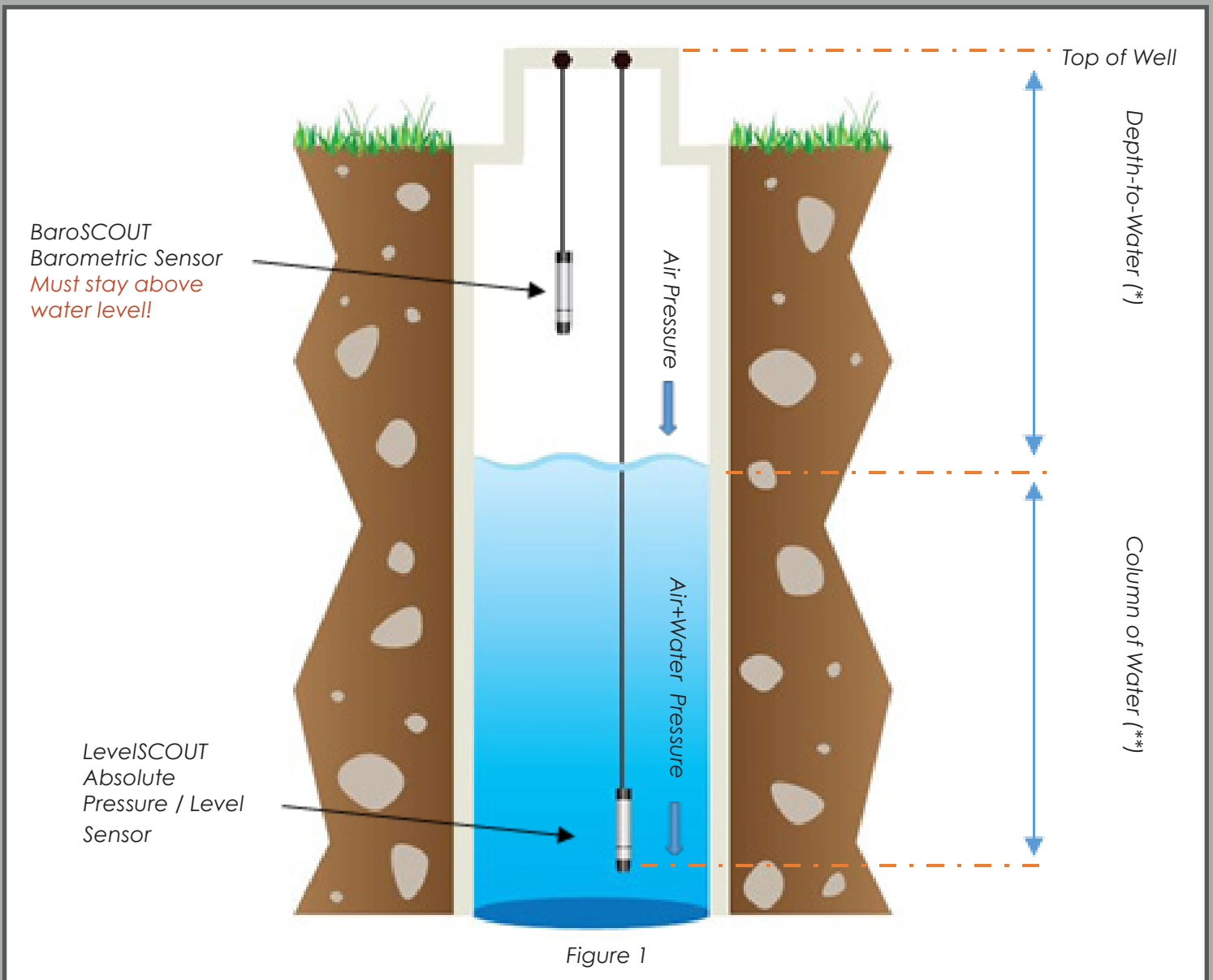


Barometric Compensation, with optional Depth-to-Water setting

The LevelSCOUT is an absolute pressure logger: that means that in addition to the pressure due to the water column above the sensor, it is also measuring the atmospheric pressure. To obtain just the pressure due to the water column, you must subtract the atmospheric pressure. This could be achieved automatically with the software (Aqua4Plus), if in addition to the LevelSCOUT you have been using a BaroSCOUT to record the barometric (atmospheric) pressure.



Barometric Compensation, with optional Depth-to-Water setting

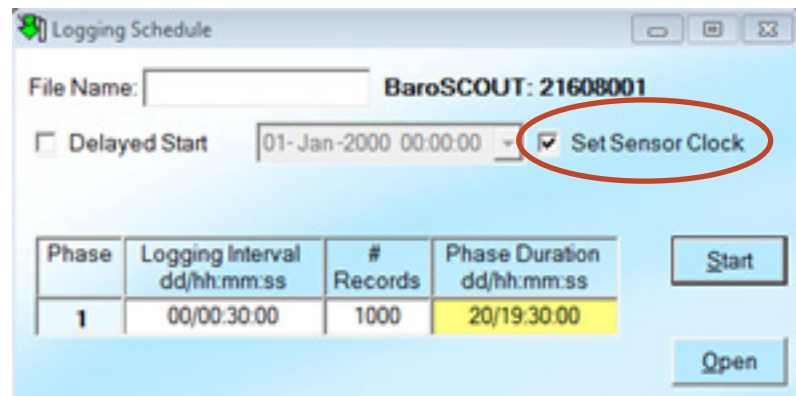
From the version 1.9.10 of the Aqua4Plus software, in addition to the barometric compensation, there is also the choice to enter a depth to water offset, and in this way compensated values could be presented related to a datum, for example "Top of Well".

A. SETUP

1. Start with BaroSCOUT

a. Connect the BaroSCOUT to the USB communication cable, click on the  Scan Button to find the BaroSCOUT.

b. Setup the logging schedule on the BaroSCOUT. Name your file by entering a name on the File Name Box. *Remember to check mark the Set Sensor Clock on the Logging Schedule Screen.*



c. Click the Start Button.


d. In order that the time sequences are fully populated we would always recommend that you set and start the BaroSCOUT first and read it last.

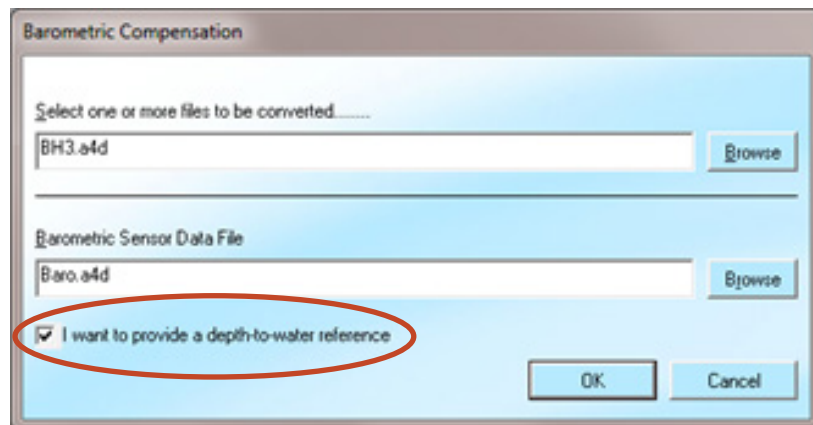
2. Now follow with the LevelSCOUT: connect it to the USB cable, and repeat steps a), b) and c) from above.

3. Deploying of the LevelSCOUT and depth-to-water measurement: the dip measurement can be made at any point in the time sequence, but good practice prefers that you do this at deployment. We would recommend that you use the top of the well as your initial datum: this is for practical reasons, as there is a clear edge against which to measure. This initial dip to water measurement should be done AFTER deployment of the logger, and this is especially important in narrow diameter wells because of the logger's water displacement. Take time over the measurement and make sure that is as accurate as possible, ensuring that your dip meter is straight and without any kinks. Once measurement has been made, **record this value and the exact time** in your field notes.

Barometric Compensation, with optional Depth-to-Water setting

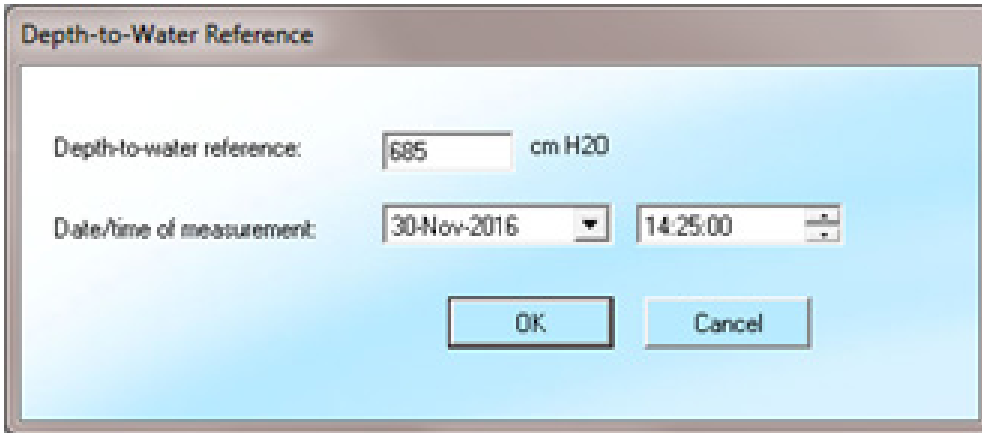
B. DATA RETRIEVAL AND COMPENSATION

1. Once you have completed your recording time, you should retrieve the data from the BaroSCOUT and LevelSCOUT: connect to the USB cable, scan for the sensor, and retrieve data 
2. Open the Barometric Compensation Utility (on the Utilities Menu of the Aqua4Plus). The following dialog will open:

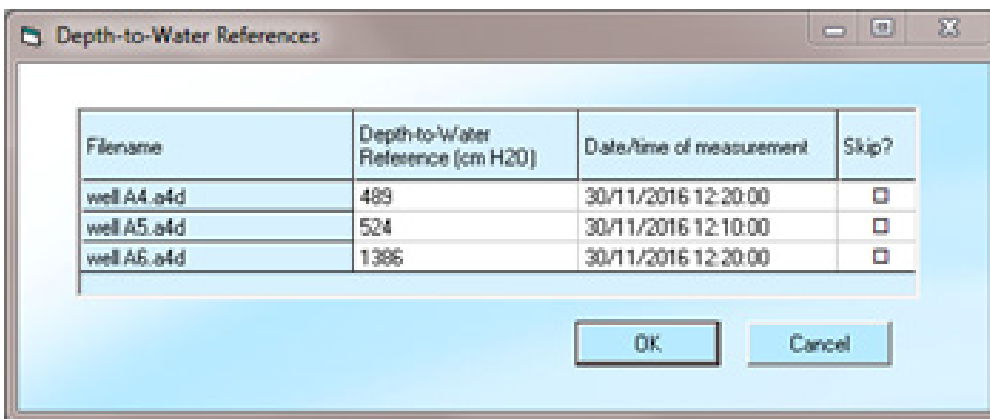


3. First, select one or more absolute data files to be converted. Click the top Browse button and navigate to the file(s) you want to convert. To select one file, simply double-click on the file name. To select two or more files, click on the first file, then hold down the Ctrl key and click on each of the other files you want to convert. Then click OK.
4. Next, select the barometric file you wish to use for the compensation. Click on the lower Browse button and navigate to the file you want to use. Double-click on the file name.
5. If you do NOT want to provide a manual depth to water reading, do not checkmark the box "I want to provide a depth-to-water reference", and proceed to step 7.
6. If you want to enter a manual depth-to-water reading, checkmark the box "I want to provide a depth-to-water reference". One of the following boxes will display, depending on whether you are converting one or many data files. For each sensor, enter the date/time and

Barometric Compensation, with optional Depth-to-Water setting



Depth-to Water Reference for a Single Sensor



Filename	Depth-to-Water Reference (cm H2O)	Date/time of measurement	Skip?
well A4.a4d	489	30/11/2016 12:20:00	<input type="checkbox"/>
well A5.a4d	524	30/11/2016 12:10:00	<input type="checkbox"/>
well A6.a4d	1386	30/11/2016 12:20:00	<input type="checkbox"/>


Depth-to Water Reference for a Multiple Sensor

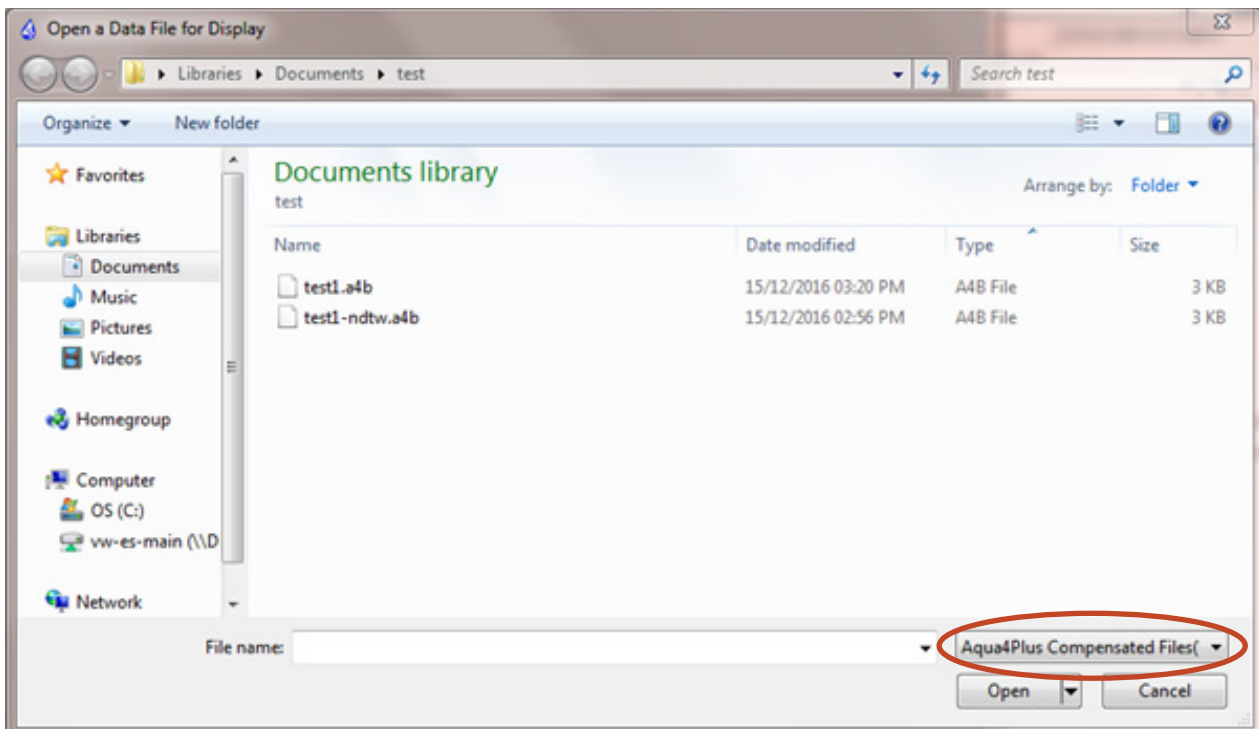
measurement you took previously. If you are converting several files, you have the option to enter depth-to-water offsets for each sensor or to checkmark the box in the Skip column, if not needed for a particular sensor. Click OK to continue.

7. To begin the conversion, click OK.
8. Aqua4Plus will take each record in the absolute data file, apply the depth-to-water offset (if applicable) and the barometric reading closest in time to that reading, and then create a new, converted file. The original data files will have an extension of .a4d. The compensated files will have the same file names but with an extension of .a4b. A compensated file will be created for each original data file.

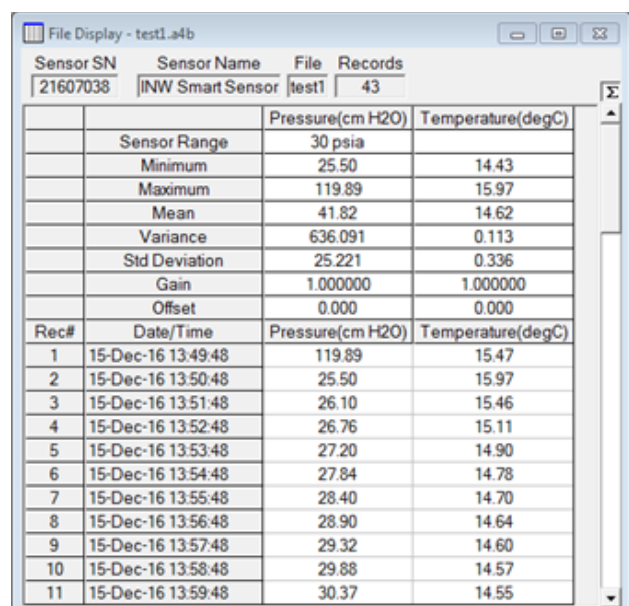
Barometric Compensation, with optional Depth-to-Water setting

C. VIEWING AND EXPORTING THE COMPENSATED DATA

- To view your newly compensated files, click on the Open button.  A File Open box will be displayed




- On the file type box, click the down arrow and select "Aqua4Plus Compensated Files." The box will then list your compensated files. (If you select "Aqua4Plus Data Files" instead, original data files will be listed.) Double-click on the file you want to open. Your data will display in the File Display window. The values on the Pressure column represent the barometrically compensated pressure.



Sensor SN	Sensor Name	File	Records		
21607038	INW Smart Sensor	test1	43		
				Pressure(cm H2O)	Temperature(degC)
	Sensor Range			30 psia	
	Minimum			25.50	14.43
	Maximum			119.89	15.97
	Mean			41.82	14.62
	Variance			636.091	0.113
	Std Deviation			25.221	0.336
	Gain			1.000000	1.000000
	Offset			0.000	0.000
Rec#	Date/Time			Pressure(cm H2O)	Temperature(degC)
1	15-Dec-16 13:49:48			119.89	15.47
2	15-Dec-16 13:50:48			25.50	15.97
3	15-Dec-16 13:51:48			26.10	15.46
4	15-Dec-16 13:52:48			26.76	15.11
5	15-Dec-16 13:53:48			27.20	14.90
6	15-Dec-16 13:54:48			27.84	14.78
7	15-Dec-16 13:55:48			28.40	14.70
8	15-Dec-16 13:56:48			28.90	14.64
9	15-Dec-16 13:57:48			29.32	14.60
10	15-Dec-16 13:58:48			29.88	14.57
11	15-Dec-16 13:59:48			30.37	14.55

Barometric Compensation, with optional Depth-to-Water setting

3. To export your data to a comma separated value file or an Excel file, click the Export  button. Exports will show general file information and calibration values for both the original data file and the barometric file that was used to do the conversion. The data will be displayed in the following columns.

Rec#: Record number in the original data file
 Date/Time: Date and time of sample from original data file
 Pressure: Barometrically compensated pressure
 Temperature: Temperature
 Sensor Pressure: Pressure from the original data file (absolute pressure)
 Barometric Date/Time: The time of the reading in the barometric file that was used for each line in the data file.

4. In case you have introduced a "Depth-to-Water" manual measurement (as shown below on the spreadsheet 1), the values on the compensated pressure column, will already have the calculation made to show the values referenced to the Top of the Well (or whichever reference you have taken to make the initial depth-to-water manual measurement): see figure 1, Depth-to-Water (*). Normally the first measurements shown on the table are taken out of the water, and they will represent the cable length used to deploy the LevelSCOUT

31	DTW Entry: 12/15/2016 13:50:00		25.31			
32	Statistical Data		Pressure(cm H2O)	Temperature(degC)		
33		Sensor Range	30 psia			
34		Minimum	25.5	14.43		
35		Maximum	119.89	15.97		
36		Mean	41.82	14.62		
37		Variance	636.091	0.113		
38		Std Deviation	25.221	0.336		
39	Rec #	Date/Time	Pressure(cm H2O)	Temperature(degC)	SensorPressure(cm H2O)	Barometric Date/Time
40	1	12/15/2016 13:49:48.0	119.89	15.47	1028.62	12/15/2016 13:49:38.00
41	2	12/15/2016 13:50:48.0	25.5	15.97	1123	12/15/2016 13:50:38.00
42	3	12/15/2016 13:51:48.0	26.1	15.46	1122.39	12/15/2016 13:51:38.00
43	4	12/15/2016 13:52:48.0	26.76	15.11	1121.8	12/15/2016 13:52:38.00
44	5	12/15/2016 13:53:48.0	27.2	14.9	1121.28	12/15/2016 13:53:38.00
45	6	12/15/2016 13:54:48.0	27.84	14.78	1120.64	12/15/2016 13:54:38.00
46	7	12/15/2016 13:55:48.0	28.4	14.7	1120.07	12/15/2016 13:55:38.00
47	8	12/15/2016 13:56:48.0	28.9	14.64	1119.57	12/15/2016 13:56:38.00

Manual depth-to-water date/ time and measurement

1st measurement out of water: represents cable length

Compensated pressure data, referenced to the top of the well (depth to water values)

Original absolute pressure data

Date/time of record that was used from the barometric file

Spreadsheet 1, with "Depth-to-Water" values

Barometric Compensation, with optional Depth-to-Water setting

5. In case you have not introduced a "Depth-to-Water" measurement (as shown below on the spreadsheet 2), the values on the compensated pressure column will show no other correction or calculation apart from the barometrically compensation, so they will be showing the value of the water column above the LevelSCOUT: see figure 1, Column of Water (**)

31						
32	Statistical Data	Pressure(cm H2O)	Temperature(degC)			
33	Sensor Range	30 psia				
34	Minimum	0.49	14.43			
35	Maximum	94.88	15.97			
36	Mean	78.56	14.62			
37	Variance	636.092	0.113			
38	Std Deviation	25.221	0.336			
39	Rec #	Date/Time	Pressure(cm H2O)	Temperature(degC)	SensorPressure(cm H2O)	Barometric Date/Time
40	1	12/15/2016 13:49:48.0	0.49	15.47	1028.62	12/15/2016 13:49:38.00
41	2	12/15/2016 13:50:48.0	94.88	15.97	1123	12/15/2016 13:50:38.00
42	3	12/15/2016 13:51:48.0	94.28	15.46	1122.39	12/15/2016 13:51:38.00
43	4	12/15/2016 13:52:48.0	93.62	15.11	1121.8	12/15/2016 13:52:38.00
44	5	12/15/2016 13:53:48.0	93.18	14.9	1121.28	12/15/2016 13:53:38.00

*1st measurement out of water:
0 cm water column*

*Compensated pressure data,
with actual water column
values*

*Original absolute pressure
data*

*Date/time of record that was
used from the barometric file*

Spreadsheet 2, with water column values